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The recent Antarctic explorations have produced a fair number of new Medusæ, many of which have well-marked and interesting specific characters, but there are only about three new genera. Probably, according to Dr. Browne, none of them will remain peculiar to the Antarctic when the ocean has been more thoroughly explored. The littoral Hydromedusæ of the Antarctic have not yet been found in the Magellanic, South Australian and New Zealand areas; it looks as if they belong to an ancient stock which has long been isolated from the rest of the world by the Great Southern Ocean. As evolution is proceeding more slowly in cold than in warm regions, the characters of an Antarctic medusa should be more primitive than those from a warmer sea. Dr. Browne gives comparisons which in a number of cases seem to sustain this view. Some very large scyphomedusæ are reported, including a *Diplulmaris* with arms twelve feet in length.

The lichen material brought back by the expedition included some twenty-five species and there are recorded from the Antarctic continent and closely adjacent islands some eighty-eight lichens. Of these thirty-eight are confined to the region between 60° and 78° south latitude, as far as known. The southern lichens do not present any new genera and occur in small quantities contrasting with the abundance found in the Arctic regions. Four species were found on the peaks of the Antarctic volcanoes, Mts. Erebus and Terror, and of these three are also inhabitants of the Arctic regions. That any indigenous organized object whatever can exist on these gloomy volcanic peaks covered with and rising out of eternal ice and snow, seems almost miraculous!

The plates of this volume are of the usual high quality, and the whole character of the work is such as would be expected from the authorities of the British Museum.

WM. H. DALL

Catalogue of the Lepidoptera Phatænæ in the British Museum. Vol. IX., Noctuidæ, 1910.

The present volume completes the account of the subfamily Acronyctinæ of the Noc-

tuidæ. It contains 725 species in 185 genera, showing a total for the subfamily of 2,288 species in 385 genera. The volumes of this series are appearing with gratifying rapidity. We have only recently noticed the publication of volume VIII. The present volume is on a par with its predecessors in general plan and execution. The table of genera for the subfamily is again repeated with final additions and corrections and will now become fully available.

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SPECIAL ARTICLES

ON THE SPECTRUM OF MARS AS PHOTOGRAPHED WITH HIGH DISPERSION¹

LET us recall that the solar spectrum, as viewed by terrestrial observers, is composite. Photospheric light, in passing out through the gases and vapors of the sun's atmosphere, is selectively absorbed, with the result that many thousands of lines are introduced into the spectrum. The transmitted light passes down through the earth's atmosphere to the observer, and the absorption by water vapor and oxygen in the terrestrial atmosphere introduces many hundreds of additional lines, at definite points in the yellow, orange and red regions. The observed spectrum of the sun is in reality the spectrum of the sun plus the spectrum of the earth. The spectrum of the moon, so far as our present problem is concerned, is simply this sun-earth spectrum.

The light from Mars is photospheric light, which passes out through the sun's atmosphere, thence down through the atmosphere of Mars to the planet's crust, where a certain proportion is reflected out through the Martian atmosphere, and thence down through the earth's atmosphere to the observer. The so-called spectrum of Mars is in reality the sun's spectrum plus Mars's spectrum plus the earth's spectrum.² Any water vapor and

¹ Read at the April, 1910, meeting of the National Academy of Sciences.

² A little of the light would be reflected from the atmospheric strata of various heights without